IN THE CLAIMS:

1- 23 (Cancelled)

24. (Currently Amended) A device for coupling a short pulse laser into a microscope beam path <u>of a laser scanning microscope used for investigation of nonlinear contrast methods</u> comprising:

a dispersive element for spatially separating the spectral components of the laser radiation;

means for manipulating individual spectral components; ~~and~~ <u>said manipulating means acts to manipulate components and the manipulator means is purposefully optimized by feeding back a measurement signal and the desired measurement signal is therefore adjusted;</u>

~~another dispersive element~~ <u>and an element</u> for spatially superimposing the manipulated individual spectral components.

25. (Cancelled)

26.(Currently Amended) The device according to claim 24, wherein, after manipulation, the spectral components are reflected at a mirror and superimposed again by the <u>element for spatially superimposing</u> ~~dispersive element~~.

27. (Original) The device according to claim 24, wherein the microscope is a laser scanning microscope.

28. (Cancelled)

29. (Original) The device according to claim 24, wherein prisms or gratings are used as dispersive elements.

30. (Original) The device according to claim 24, wherein the manipulator means

generates an amplitude modulation of the spectral components.

31. (Original) The device according to claim 24, wherein the manipulator means generates a phase modulation of the spectral components.

32. (Currently Amended) The device according to claim 24, wherein the device is followed by a single-mode fiber ~~F~~ for coupling in a short pulse laser.

33. (Currently Amended) The device according to claim 24, wherein ~~the~~ a single-mode fiber is also polarization-preserving.

34. (Orignal) The device according to claim 24, wherein a spatial light modulator is used in the Fourier plane as a manipulator means.

35. (Cancelled)

36. (Original) The device according to claim 31, wherein the phase modulation in the manipulator means is used to compensate higher-order dispersion by the use of the feedback.

37. (Currently Amended) The device according to claim ~~31~~ 47, wherein the phase modulation in the manipulator means is optimized depending on the center wavelength of the short pulse laser by the use of feedback.

38. (Original) The device according to claim ~~31~~, 47 wherein the phase modulation in the manipulator means is optimized depending on the utilized objective by the use of the feedback.

39. (Currently Amended) The device according to claim ~~31~~, 47 wherein the phase modulation in the manipulator means is optimized depending on the utilized average output by the use of feedback.

40. (Currently Amended) The device according to claim ~~31~~, 47 wherein, by the use of feedback, the phase modulation in the manipulator means is adjusted depending on the depth of penetration into a preparation to be examined and a nonlinearly excited fluorescence signal is therefore optimized.

41. (Currently Amended) The device according to claim ~~24~~, 47 wherein ~~the~~ a pulse front and ~~the~~ a spherical aberration are optimized additionally by an adaptive acousto-optic element ~~adaptive element AO~~.

42. (Currently Amended) The device according to claim ~~31~~, 47 wherein the phase modulation in the manipulator means is optimized depending on the utilized objective by the use of feedback.

43. (Currently Amended) The device according to claim ~~24~~, 47 wherein a specific excitation of fluorescence dyes is carried out by phase modulation and amplitude modulation in the manipulator means.

44. (Currently Amended) The device according to claim ~~42~~, 24 wherein the optimization is carried out selectively.

45. (Original) The device according to claim 24, wherein a specific resolution of reactions in the fluorescence dyes is carried out by phase modulation and amplitude modulation in the manipulator means.

46. (Original) The device according to claim 24, wherein a specific bleaching of dyes is carried out by phase modulation and amplitude modulation in the manipulator means.

47. (New) A device for coupling a short pulse laser into a microscope beam path of a laser scanning microscope comprising:

a dispersive element for spatially separating the spectral components of the laser

radiation;

means for manipulating individual spectral components; wherein the manipulator means is purposefully optimized by feeding back a measurement signal and the desired measurement signal is therefore adjusted; and

an element for spatially superimposing the manipulated individual spectral components.

Respectfully submitted,

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